

## Grades 3–5: Algebra

### **STANDARD I. Understand patterns, relations, and functions.**

#### **EXPECTATION A. Describe, extend, and make generalizations about geometric and numeric patterns.**

3	4	5
1. Describe, create, and extend numeric patterns with and without models and calculators.	1. Using models and calculators, create, extend, and analyze numeric patterns (including decimal patterns through thousandths).	1. Using models and calculators, analyze and extend numeric and geometric patterns such as triangular numbers, perfect squares, and arithmetic sequences. 2. Find the missing elements in numeric and nonnumeric patterns.

#### **EXPECTATION B. Represent and analyze patterns and functions, using words, tables, and graphs.**

3	4	5
1. Determine the pattern to identify missing numbers in a sequence and in a table of number pairs. *2. Use pattern identification to solve problems.	1. Describe and represent number relationships with tables. *2. Determine the rule to identify missing numbers in a sequence or a table.	*1. Represent and analyze patterns and functions using words, tables, and graphs. 2. Analyze, describe, and use function rules to make generalizations.

**STANDARD** II. Represent and analyze mathematical situations and structures using algebraic symbols.

**EXPECTATION** A. Identify such properties as commutativity, associativity, and distributivity and use them to compute with whole numbers.

*For all three grade levels, refer to these concepts in the “Number and Operations” strand.*

**EXPECTATION** B. Represent the idea of a variable as an unknown quantity using a letter or a symbol.

3	4	5
1. Use concrete or pictorial models and symbols to represent missing addends or factors.	1. Use variables to represent an unknown quantity using a letter or a symbol.	1. Use variables to write a mathematical expression in symbolic form.

**EXPECTATION** C. Express mathematical relationships using equations.

3	4	5
*1. Use concrete or pictorial models and symbols to identify missing addends or factors in equations that express relationships between two quantities.	*1. Use equations to represent relationships.	*1. Use a variable to write an open sentence representing a given mathematical relationship.

**STANDARD III. Use mathematical models to represent and understand quantitative relationships.**

**EXPECTATION A. Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.**

<b>3</b>	<b>4</b>	<b>5</b>
*1. Use patterns and relationships in a variety of real-world contexts.		1. Use a single variable to create a problem situation based on a given open sentence.

**STANDARD IV. Analyze change in various contexts.**

**EXPECTATION A. Investigate how a change in one variable relates to a change in a second variable.**

<b>3</b>	<b>4</b>	<b>5</b>
	1. Describe how a rate of growth varies over time.	1. Describe the relationship among distance, speed, and time.

**EXPECTATION B. Identify and describe situations with constant or varying rates of change and compare them.**

<b>3</b>	<b>4</b>	<b>5</b>
1. Identify real situations and events that show change.	*1. Using charts and graphs, describe changes over time as increasing, decreasing, and varying.	1. Create charts and graphs to show change over time.
		2. Represent situations with number tables, graphs, and verbal descriptions.
		*3. Associate tables, graphs, and stories of the same event.